I. AMENDMENT

In the claims:

Please amend claims 1-7, 9-12, 14-26, 29-32, 35, 37, 40, 42, 46-50, 53-56, 59-64, 66-67, 74-76, 78-79, 81-85 and 88-97. Please cancel claims 27, 28, 77 and 80 without prejudice. Claims 1-7, 9-12, 14-26, 29-50 and 52-98 are pending.

1. (Currently Amended) A camera system, comprising:

a first slip ring apparatus, said first slip ring apparatus comprising:

a first slip ring component, said first slip ring component comprising a first interface surface and at least one first dynamic interface component, [[;]] and

a second slip ring component, said second slip ring component comprising a second interface surface and at least one second dynamic interface component, [[;]]

wherein said first and second slip ring components are rotatably coupled together on an axis of slip ring rotation so that said first and second interface surfaces are disposed in facing relationship to form a slip ring boundary therebetween, said axis of slip ring rotation being perpendicular to the plane of said slip ring boundary, and said first and second dynamic interface components being positioned to interact with each other to communicate at least one serial digital signal across said slip ring boundary; ~~, said serial digital signal being produced by serializer circuitry integrated within at least one of said first or second slip ring components~~

an optical block coupled to said first slip ring apparatus so that it rotates with said first slip ring component relative to said second slip ring component, said first slip ring component being coupled between said optical block and said second slip ring component; and

a first drive actuator coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block relative to said second slip ring component;

wherein said first drive actuator is coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block in a pan axis direction; and

wherein said camera system further comprises a second slip ring apparatus coupled to said optical block and a second drive actuator coupled to said second slip ring apparatus to impart rotation to said optical block in a tilt axis direction.

2. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 1, wherein said first and second dynamic interface components are positioned to interact with each other to communicate at least one serial digital signal across said slip ring boundary at the same time at least one of said first and second slip ring components is rotating about said axis of slip ring rotation relative to the other of said first and second slip ring components.

3. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 2, wherein said at least one of said first and second slip ring components that is rotating about said axis of slip ring rotation relative to the other of said first and second slip ring components comprises a printed circuit board.

4. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 2, wherein said at least one of said first and second slip ring components that is rotating about said axis of slip ring rotation relative to the other of said first and second slip ring components comprises integrated feedback circuitry.

5. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 2, wherein said first and second dynamic interface components comprise components of position sensor circuitry.

6. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 5, wherein said first and second dynamic interface components each comprise tracks of intermittently-spaced conductive segments that form capacitive sensor components of a position sensor mechanism.

7. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 2, wherein said at least one of first and second slip ring components that is rotating about said axis of slip ring rotation relative to the other of said first and second slip ring components comprises a printed circuit board, said printed circuit board comprising position sensor circuitry.

8. (Canceled)

9. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 2, wherein said first dynamic interface component comprises at least one of a conductive trace or a contact pad; and wherein said second dynamic interface component comprises a brush contact.

10. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 1, wherein said first slip ring component comprises a printed circuit board ~~and is configured to be coupled to an optical block so that said optical block is rotatable with said first slip ring component relative to said second slip ring component~~; and wherein said printed circuit board of said first slip ring component comprises at least one of control circuitry for said optical block, image processing circuitry for said optical block, power conversion circuitry for said optical block, or a combination thereof.

11. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 1, wherein said first and second dynamic interface components are positioned to interact with each other to communicate at least one serial digital signal across said slip ring boundary at the same time at least one of said first and second slip ring components is rotating about said axis of slip ring rotation relative to the other of said first and second slip ring components, said at least one serial digital signal comprising a forward or return optical block control signal or an optical block image signal.

12. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 1, wherein said first slip ring component comprises a printed circuit board ~~and is configured to be coupled to a drive actuator so that said drive actuator is capable of imparting rotation to said first slip ring component relative to said second slip ring component~~; and wherein said printed circuit board of said first slip ring component comprises control circuitry for said first drive actuator.

13. (Canceled)

14. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 1, further comprising a first housing component fixedly coupled to said first slip ring component, and a second housing component fixedly coupled to said second slip ring component so that said first and second slip ring components are disposed between said first second

housing components and so that said first and second housing components form a slip ring housing around said first and second slip ring components; wherein said first housing component comprises a first peripheral sealing surface and wherein said second housing component comprises a second peripheral sealing surface; and wherein said first peripheral sealing surface of said first housing component rotatably and sealably mates with said second peripheral surface of said second housing component to form a dynamic seal around the periphery of said slip ring housing.

15. (Currently Amended) A camera system, comprising:

a first slip ring apparatus, said first slip ring apparatus comprising:

a first slip ring component, said first slip ring component comprising a first interface surface and at least one first dynamic interface component, [[;]] and

a second slip ring component, said second slip ring component comprising a second interface surface and at least one second dynamic interface component, [[;]]

wherein said first and second slip ring components are rotatably coupled together on an axis of slip ring rotation so that said first and second interface surfaces are disposed in facing relationship to form a slip ring boundary therebetween, said axis of slip ring rotation being perpendicular to the plane of said slip ring boundary, and said first and second dynamic interface components being positioned to interact with each other to communicate at least one signal across said slip ring boundary at the same time at least one of said first and second slip ring components is rotating about said axis of slip ring rotation relative to the other of said first and second slip ring components;

an optical block coupled to said first slip ring apparatus so that it rotates with said first slip ring component relative to said second slip ring component, said first slip ring component being coupled between said optical block and said second slip ring component; and

a first drive actuator coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block relative to said second slip ring component;

wherein said first drive actuator is coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block in a pan axis direction;

wherein said camera system further comprises a second slip ring apparatus coupled to said optical block and a second drive actuator coupled to said second slip ring apparatus to impart rotation to said optical block in a tilt axis direction; and

wherein said at least one of said ~~first and second interface surfaces of said~~ first and second slip ring components that is rotating about said axis of slip ring rotation relative to the other of said first and second slip ring components comprises a printed circuit board~~; and~~

~~wherein said printed circuit board comprises integrated circuitry configured to process said at least one signal~~.

16. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 15, wherein said first and second dynamic interface components are positioned to interact with each other to continuously communicate said at least one signal across said slip ring boundary at the same time said printed circuit board of said at least one of said first and second slip

ring components is rotating relative to said other of said first and second slip ring components.

17. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 16, wherein said at least one signal at least one signal communicated across said slip ring boundary comprises a forward or return optical block control signal, an optical block image signal, or an optical block power signal.

18. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 16, wherein said first slip ring component comprises a printed circuit board; ~~wherein said first slip ring component is configured to be coupled to an optical block so that said optical block is rotatable with said first slip ring component relative to said second slip ring component;~~ and wherein said printed circuit board of said first slip ring component comprises at least one of control circuitry for said optical block, image processing circuitry for said optical block, power conversion circuitry for said optical block, or a combination thereof.

19. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 18, wherein said at least one signal communicated across said slip ring boundary comprises multiple signals transmitted across said slip ring boundary, said multiple signals comprising a forward or return optical block control signal, a processed optical block image signal, and an optical block power signal.

20. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 18, ~~wherein said first slip ring is configured to be coupled to a drive actuator so that said drive actuator is capable of imparting rotation to said first slip ring component relative to said second slip ring component; and~~ wherein said printed circuit board of said first slip ring component further comprises control circuitry for said first drive actuator.

21. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 19, wherein said first slip ring component comprises a moving first slip ring component printed circuit board substrate; wherein said second slip ring component comprises a stationary second slip ring component substrate; and wherein said first and second dynamic interface components are positioned to interact with each other so as to communicate at least one signal across said slip ring boundary at the same time said moving first slip ring component is rotating relative to said stationary second slip ring component.

22. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 21, wherein said first dynamic interface component comprises at least one of a conductive trace or a contact pad; and wherein said second dynamic interface component comprises a brush contact.

23. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 22, wherein said first dynamic interface component comprises a first track of intermittently-spaced conductive segments, and wherein said second dynamic interface component comprises a second track of intermittently-spaced conductive segments; said first and second tracks of intermittently-spaced conductive segments being positioned to interact with each other without contacting to form a position sensor mechanism.

24. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 23, further comprising a first housing component fixedly coupled to said first slip ring component, and a second housing component fixedly coupled to said second slip ring component so that said first and second slip ring components are disposed between said first and second housing components.

25. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 24, wherein said first and second housing components form a slip ring housing around said first and second slip ring components; wherein said first housing component comprises a first

circular peripheral sealing surface and wherein said second housing component comprises a second circular peripheral sealing surface; and wherein said first circular peripheral sealing surface of said first housing component rotatably and sealably mates with said second circular peripheral surface of said second housing component to form a dynamic seal around the periphery of said slip ring housing.

26. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 25, wherein said dynamic seal comprises a ferro-fluidic seal.

27. (Canceled)

28. (Canceled)

29. (Currently Amended) The camera system of claim ~~28~~ 97, wherein said first drive actuator comprises a voice coil servo mechanism coupled between said first slip ring component and said optical block.

30. (Currently Amended) The camera system of claim ~~28~~ 97, wherein each of said first and second slip ring component substrates comprises a printed circuit board; and wherein said printed circuit board of said first slip ring component comprises at least one of control circuitry for said optical block, image processing circuitry for said optical block, power conversion circuitry for said optical block, control circuitry for said first drive actuator, or a combination thereof.

31. (Currently Amended) The camera system of claim ~~28~~ 97, wherein said at least one signal communicated across said slip ring boundary comprises multiple signals transmitted across said slip ring boundary, said multiple signals comprising a forward or

return optical block control signal, a processed optical block image signal, and an optical block power signal.

32. (Currently Amended) The camera system of claim ~~28~~ 97, wherein each of said first and second slip ring component substrates comprises a printed circuit board; and wherein said printed circuit board of said first slip ring component comprises control circuitry for said optical block, image processing circuitry for said optical block, power conversion circuitry for said optical block, and control circuitry for said first drive actuator.

33. (Original) The camera system of claim 32, wherein said at least one signal communicated across said slip ring boundary comprises multiple signals transmitted across said slip ring boundary, said multiple signals comprising a forward or return optical block control signal, a processed optical block image signal, and an optical block power signal.

34. (Original) The camera system of claim 31, wherein each of said multiple signals is communicated across said slip ring boundary by at least one first dynamic interface component to at least one second dynamic interface component; wherein said first dynamic interface component comprises a conductive trace and said second dynamic interface component comprises a brush contact; and wherein said first and second dynamic interface components are positioned to continuously contact each other to communicate said at least one signal across said slip ring boundary at the same time said first slip ring component is rotating relative to said second slip ring component.

35. (Currently Amended) The camera system of claim ~~28~~ 97, wherein said first dynamic interface component comprises a first track of intermittently-spaced conductive segments, and wherein said second dynamic interface component comprises a second track of intermittently-spaced conductive segments; said first and second tracks of intermittently-

spaced conductive segments being positioned to interact with each other without contacting to form a position sensor mechanism.

36. (Original) The camera system of claim 30, wherein said first dynamic interface component comprises a first track of intermittently-spaced conductive segments, and wherein said second dynamic interface component comprises a second track of intermittently-spaced conductive segments; said first and second tracks of intermittently-spaced conductive segments being positioned to interact with each other without contacting to form a position sensor mechanism.

37. (Currently Amended) The camera system of claim ~~28~~ 97, further comprising a first housing component fixedly coupled to said first slip ring component, and a second housing component fixedly coupled to said second slip ring component so that said first and second slip ring components are disposed between said first and second housing components.

38. (Previously Presented) The camera system of claim 37, wherein said first and second housing components form a slip ring housing around said first and second slip ring components; wherein said first housing component comprises a first circular peripheral sealing surface and wherein said second housing component comprises a second circular peripheral sealing surface; and wherein said first circular peripheral sealing surface of said first housing component rotatably and sealably mates with said second circular peripheral surface of said second housing component to form a dynamic seal around the periphery of said slip ring housing.

39. (Original) The camera system of claim 38, wherein said dynamic seal comprises a ferro-fluidic seal.

40. (Currently Amended) ~~The camera system of claim 28~~ A camera system, comprising:

a first slip ring apparatus, said first slip ring apparatus comprising:

a moving first slip ring component, said first slip ring component comprising a first slip ring component substrate that comprises a circular platter having a first planar interface surface defined thereon, and at least one first dynamic interface component supported by said first slip ring component substrate, and

a stationary second slip ring component, said second slip ring component comprising a second slip ring substrate that comprises a circular platter having a second planar interface surface defined thereon, and at least one second dynamic interface component supported by said second slip ring component substrate,

wherein said first and second slip ring components are rotatably coupled together so that said first slip ring component rotates relative to said second slip ring component, so that said first and second interface surfaces are disposed in mating facing relationship to form a slip ring boundary therebetween, and so that said first and second dynamic interface components are positioned to interact with each other to continuously communicate at least one signal across said slip ring boundary at the same time said first slip ring component is rotating relative to said second slip ring component;

an optical block coupled to said first slip ring apparatus so that it rotates with said first slip ring component relative to said second slip ring component, said first slip ring component being coupled between said optical block and said second slip ring component; and

a first drive actuator coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block relative to said second slip ring component;

wherein said first interface surface of said first slip ring component substrate comprises a printed circuit board;

wherein said printed circuit board comprises integrated circuitry configured to process said at least one signal;

wherein said first drive actuator is coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block in a pan axis direction; and wherein said camera system further comprises a second slip ring apparatus coupled to said optical block and a second drive actuator coupled to said second slip ring apparatus to impart rotation to said optical block in a tilt axis direction.

41. (Previously Presented) The camera system of claim 40, wherein said second slip ring apparatus comprises:

a moving first slip ring component, said first slip ring component of said second slip ring apparatus comprising a first slip ring component substrate that comprises a circular platter having a first planar interface surface defined thereon, and at least one first dynamic interface component supported by said first slip ring component substrate of said second slip ring apparatus; and

a stationary second slip ring component, said second slip ring component of said second slip ring apparatus comprising a second slip ring substrate that comprises a circular platter having a second planar interface surface

defined thereon, and at least one second dynamic interface component supported by said second slip ring component substrate of said second slip ring apparatus;

wherein said first and second slip ring components of said second slip ring apparatus are rotatably coupled together so that said first slip ring component of said second slip ring apparatus rotates relative to said second slip ring component of said second slip ring apparatus, so that said first and second interface surfaces of said second slip ring apparatus are disposed in mating facing relationship to form a slip ring boundary of said second slip ring apparatus therebetween, and so that said first and second dynamic interface components of said second slip ring apparatus are positioned to interact with each other to continuously communicate at least one signal across said slip ring boundary of said second slip ring apparatus at the same time said first slip ring component of said second slip ring apparatus is rotating relative to said second slip ring component of said second slip ring apparatus; and

wherein said optical block is coupled to said second slip ring apparatus so that it rotates with said first slip ring component of said second slip ring apparatus relative to said second slip ring component of said second slip ring apparatus, said first slip ring component of said second slip ring apparatus being coupled between said optical block and said second slip ring component of said second slip ring apparatus.

42. (Currently Amended) A method of communicating at least one serial digital signal across a slip ring boundary, said method comprising providing a camera system that comprises ~~comprising~~:

~~providing~~ a first slip ring apparatus, said first slip ring apparatus comprising:

a first slip ring component, said first slip ring component comprising a first interface surface and at least one first dynamic interface component, and

a second slip ring component, said second slip ring component comprising a second interface surface and at least one second dynamic interface component,

wherein said first and second slip ring components are rotatably coupled together on an axis of slip ring rotation so that said first and second interface surfaces are disposed in facing relationship to form said slip ring boundary therebetween, said axis of slip ring rotation being perpendicular to the plane of said slip ring boundary, and said first and second dynamic interface components being positioned to interact with each other to communicate at least one serial digital signal across said slip ring boundary;

an optical block coupled to said first slip ring apparatus so that it rotates with said first slip ring component relative to said second slip ring component, said first slip ring component being coupled between said optical block and said second slip ring component; and

a first drive actuator coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block relative to said second slip ring component;

wherein said first drive actuator is coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block in a pan axis direction;

wherein said camera system further comprises a second slip ring apparatus coupled to said optical block and a second drive actuator coupled to said second slip ring apparatus to impart rotation to said optical block in a tilt axis direction; and

wherein said method further comprises:

rotating at least one of said first and second slip ring components about said axis of slip ring rotation relative to the other of said first and second slip ring components, [[;]] and

using said first and second dynamic interface components to communicate said at least one serial digital signal across said slip ring boundary simultaneously with said rotation~~, said serial digital signal being produced by serializer circuitry integrated within at least one of said first or second slip ring components~~.

43. (Previously Presented) The method of claim 42, wherein said first and second dynamic interface components comprise components of position sensor circuitry, and wherein said method further comprises using said first and second dynamic interface components to sense a position of said first slip ring component relative to said second slip ring component.

44. (Original) The method of claim 42, further comprising rotating said first slip ring component while holding said second slip ring component stationary.

45. (Original) The method of claim 42, wherein said first dynamic interface component comprises at least one of a conductive trace or a contact pad; and wherein said second dynamic interface component comprises a brush contact.

46. (Currently Amended) The method of claim 42, wherein said first slip ring component comprises a printed circuit board; wherein said method further comprises ~~providing an optical block coupled to said first slip ring component so that said optical block is rotatable with said first slip ring component relative to said second slip ring component, and~~ rotating said optical block with said first slip ring component; and wherein said printed circuit board of said first slip ring component comprises at least one of control circuitry for said optical block, image processing circuitry for said optical block, power conversion circuitry for said optical block, or a combination thereof.

47. (Currently Amended) The method of claim 42, wherein said first slip ring component comprises a printed circuit board; and wherein said method further comprises:

~~providing an optical block coupled to said first slip ring component so that said optical block is rotatable with said first slip ring component relative to said second slip ring component;~~

rotating said optical block with said first slip ring component; and

controlling said optical block at least in part using circuitry of said printed circuit board, or processing image data from said optical block at least in part using circuitry of said printed circuit board, or providing power for said optical block at least in part using circuitry of said printed circuit board, or a combination thereof.

48. (Currently Amended) The method of claim 42, wherein said method further comprises ~~providing an optical block coupled to said first slip ring component so that said optical block is rotatable with said first slip ring component relative to said second slip ring component, and~~ rotating said optical block with said first slip ring component; and

wherein said at least one serial digital signal comprises a forward or return optical block control signal or an optical block image signal.

49. (Currently Amended) The method of claim 42, wherein said first slip ring component comprises a printed circuit board; and wherein said method further comprises:

~~providing a drive actuator coupled to said first slip ring component;~~

using said first drive actuator to rotate said first slip ring component relative to said second slip ring component; and

controlling said first drive actuator at least in part using circuitry of said printed circuit board.

50. (Currently Amended) The method of claim 49, wherein said method further comprises:

~~providing an optical block coupled to said first slip ring component so that said optical block is rotatable with said first slip ring component relative to said second slip ring component;~~

using said first drive actuator to rotate said first slip ring component and said optical block relative to said second slip ring component; and

controlling said optical block at least in part using circuitry of said printed circuit board, or processing image data from said optical block at least in part using circuitry of said printed circuit board, or providing power for said optical block at least in part using circuitry of said printed circuit board, or a combination thereof.

51. (Canceled)

52. (Previously Presented) The method of claim 42, wherein said first slip ring component comprises a first slip ring component substrate and wherein said second slip ring component comprises a second slip ring component substrate, each of said first and second slip ring component substrates comprising a circular platter; and wherein said method further comprises:

providing a first housing component fixedly coupled to said first slip ring component, and a second housing component fixedly coupled to said second slip ring component so that said first and second slip ring components are disposed between said first second housing components and so that said first and second housing components form a slip ring housing around said first and second slip ring components;

wherein said first housing component comprises a first circular peripheral sealing surface and wherein said second housing component comprises a second circular peripheral sealing surface; and

wherein said first circular peripheral sealing surface of said first housing component rotatably and sealably mates with said second circular peripheral surface of said second housing component to form a dynamic seal around the periphery of said slip ring housing.

53. (Currently Amended) A camera system, comprising:

a first slip ring apparatus, said first slip ring apparatus comprising:

a first slip ring component, said first slip ring component comprising at least two first dynamic interface components, ~~; and~~

a second slip ring component, said second slip ring component comprising at least two second dynamic interface components, and [[;]]

~~serializer circuitry integrated within said first slip ring component and~~ wherein said first slip ring component is coupled to circuitry configured to generate a differential serial digital signal, [[;]]

wherein said first and second slip ring components are rotatably coupled together to form a slip ring boundary therebetween, said first and second dynamic interface components being positioned to interact with each other to communicate said differential serial digital signal across said slip ring boundary;

an optical block coupled to said first slip ring apparatus so that it rotates with said first slip ring component relative to said second slip ring component, said first slip ring component being coupled between said optical block and said second slip ring component; and

a first drive actuator coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block relative to said second slip ring component;

wherein said first drive actuator is coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block in a pan axis direction; and

wherein said camera system further comprises a second slip ring apparatus coupled to said optical block and a second drive actuator coupled to said

second slip ring apparatus to impart rotation to said optical block in a tilt axis direction.

54. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 53, wherein said differential serial digital signal comprises a differential serial digital video signal.

55. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 53, wherein said first slip ring component comprises a first interface surface, and said second slip ring component comprises a second interface surface; wherein said first and second slip ring components are rotatably coupled together on an axis of slip ring rotation so that said first and second interface surfaces are disposed in facing relationship to form said slip ring boundary therebetween, said axis of slip ring rotation being perpendicular to the plane of said slip ring boundary; and wherein said first and second dynamic interface components are positioned to interact with each other to communicate said differential serial digital signal across said slip ring boundary ring at the same time at least one of said first and second slip ring components is rotating relative to the other of said first and second slip ring components.

56. (Currently Amended) A method of communicating at least one differential serial digital signal across a slip ring boundary, said method comprising providing a camera system that comprises ~~comprising~~:

~~providing~~ a first slip ring apparatus, said first slip ring apparatus comprising:

a first slip ring component, said first slip ring component comprising at least two first dynamic interface components, and

a second slip ring component, said second slip ring component comprising at least two second dynamic interface components, ~~and~~

~~serializer circuitry integrated within said first slip ring component,~~

wherein said first and second slip ring components are rotatably coupled together to form a slip ring boundary therebetween, said first and second dynamic interface components being positioned to interact with each other to communicate said at least one differential digital signal across said slip ring boundary;

an optical block coupled to said first slip ring apparatus so that it rotates with said first slip ring component relative to said second slip ring component, said first slip ring component being coupled between said optical block and said second slip ring component; and

a first drive actuator coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block relative to said second slip ring component;

wherein said first drive actuator is coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block in a pan axis direction;

wherein said camera system further comprises a second slip ring apparatus coupled to said optical block and a second drive actuator coupled to said second slip ring apparatus to impart rotation to said optical block in a tilt axis direction; and

wherein said method further comprises:

rotating at least one of said first and second slip ring components relative to the other of said first and second slip ring components, [[;]] and

using said first and second dynamic interface components to communicate said at least one differential serial digital signal across said slip ring boundary simultaneously with said rotation.

57. (Previously Presented) The method of claim 56, wherein said differential serial digital signal comprises a differential serial digital video signal.

58. (Previously Presented) The method of claim 56, wherein said first slip ring component comprises a first interface surface, and said second slip ring component comprises a second interface surface; wherein said first and second slip ring components are rotatably coupled together on an axis of slip ring rotation so that said first and second interface surfaces are disposed in facing relationship to form said slip ring boundary therebetween, said axis of slip ring rotation being perpendicular to the plane of said slip ring boundary; wherein said first and second dynamic interface components are positioned to interact with each other to communicate said differential serial digital signal across said slip ring boundary ring at the same time at least one of said first and second slip ring components is rotating relative to the other of said first and second slip ring components; and wherein said rotating comprises rotating at least one of said first and second slip ring components about said axis of slip ring rotation relative to the other of said first and second slip ring components.

59. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 1, wherein said at least one serial digital signal comprises a high speed serial digital signal.

60. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 2, wherein said at least one of said first and second slip ring components that is rotating about said

axis of slip ring rotation relative to the other of said first and second slip ring components comprises video processing circuitry.

61. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 14, wherein said dynamic seal comprises a ferro-fluidic seal.

62. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 15, wherein said printed circuit board comprises integrated feedback circuitry.

63. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 15, wherein said printed circuit board comprises video processing circuitry.

64. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim ~~27~~ 97, wherein said at least one signal comprises a serial digital signal.

65. (Previously Presented) The camera system of claim 64, wherein said serial digital signal comprises a high speed serial digital signal.

66. (Currently Amended) The camera system of claim ~~27~~ 97, wherein said printed circuit board comprises integrated feedback circuitry.

67. (Currently Amended) The camera system of claim ~~27~~ 97, wherein said printed circuit board comprises video processing circuitry.

68. (Previously Presented) The method of claim 42, wherein said at least one serial digital signal comprises a high speed serial digital signal.

69. (Previously Presented) The method of claim 42, wherein said first slip ring component further comprises integrated feedback circuitry; and wherein said method further comprises rotating said first slip ring component about said axis of slip ring rotation relative to said second slip ring component.

70. (Previously Presented) The method of claim 42, wherein said first slip ring component further comprises video processing circuitry; and wherein said method further comprises rotating said first slip ring component about said axis of slip ring rotation relative to said second slip ring component.

71. (Previously Presented) The method of claim 52, wherein said dynamic seal comprises a ferro-fluidic seal.

72. (Previously Presented) The slip ring apparatus of claim 53, wherein said differential serial digital signal comprises a high speed differential serial digital signal.

73. (Previously Presented) The method of claim 56, wherein said differential serial digital signal comprises a high speed differential serial digital signal.

74. (Currently Amended) A camera system, comprising:

a first slip ring apparatus, said first slip ring apparatus comprising:

a first slip ring component, said first slip ring component comprising at least one first dynamic interface component, [[;]] and

a second slip ring component, said second slip ring component comprising at least one second dynamic interface component, [[;]]

wherein said first and second slip ring components are rotatably coupled together to form a slip ring boundary therebetween, said first and second dynamic interface components being positioned to interact with each other to communicate at least one signal across said slip ring boundary, [[;]] and

wherein at least one of said first and second slip ring components comprises integrated feedback circuitry;

an optical block coupled to said first slip ring apparatus so that it rotates with said first slip ring component relative to said second slip ring component, said first slip ring component being coupled between said optical block and said second slip ring component; and

a first drive actuator coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block relative to said second slip ring component;

wherein said first drive actuator is coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block in a pan axis direction; and

wherein said camera system further comprises a second slip ring apparatus coupled to said optical block and a second drive actuator coupled to said second slip ring apparatus to impart rotation to said optical block in a tilt axis direction.

75. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 74, wherein said first slip ring component further comprises a first interface surface; wherein said second slip ring component comprises a second interface surface; and wherein said first and second slip ring components are rotatably coupled together on an axis of slip ring

rotation so that said first and second interface surfaces are disposed in facing relationship to form said slip ring boundary therebetween, said axis of slip ring rotation being perpendicular to the plane of said slip ring boundary.

76. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 75, wherein said first slip ring component comprises a moving slip ring component and said second slip ring component comprises a stationary slip ring component; and wherein said first slip ring component comprises said integrated feedback circuitry~~; and wherein said first slip ring component is configured to be coupled to an optical block so that said optical block is rotatable with said first slip ring component relative to said second slip ring component~~.

77. (Canceled)

78. (Currently Amended) A camera system, comprising:

a first slip ring apparatus, said first slip ring apparatus comprising:

a first slip ring component, said first slip ring component comprising a first interface surface and at least one first dynamic interface component, [[;]]

a second slip ring component, said second slip ring component comprising a second interface surface and at least one second dynamic interface component, [[;]] and

a first housing component fixedly coupled to said first slip ring component, and a second housing component fixedly coupled to said

second slip ring component so that said first and second slip ring components are disposed between said first second housing components and so that said first and second housing components form a slip ring housing around said first and second slip ring components, [[;]]

wherein said first and second slip ring components are rotatably coupled together on an axis of slip ring rotation so that said first and second interface surfaces are disposed in facing relationship to form a slip ring boundary therebetween, said axis of slip ring rotation being perpendicular to the plane of said slip ring boundary, and said first and second dynamic interface components being positioned to interact with each other to communicate at least one signal across said slip ring boundary; ~~and~~

an optical block coupled to said first slip ring apparatus so that it rotates with said first slip ring component relative to said second slip ring component, said first slip ring component being coupled between said optical block and said second slip ring component; and

a first drive actuator coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block relative to said second slip ring component;

wherein said first drive actuator is coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block in a pan axis direction; and

wherein said camera system further comprises a second slip ring apparatus coupled to said optical block and a second drive actuator coupled to said second slip ring apparatus to impart rotation to said optical block in a tilt axis direction;

wherein said first housing component comprises a first peripheral sealing surface and wherein said second housing component comprises a second peripheral sealing surface; and wherein said first peripheral sealing surface of said first housing component rotatably and sealably mates with said second peripheral surface of said second housing component to form a dynamic ferro-fluidic seal around the periphery of said slip ring housing.

79. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 78, wherein said first slip ring component comprises a moving slip ring component and said second slip ring component comprises a stationary slip ring component~~; and wherein said first slip ring component is configured to be coupled to an optical block so that said optical block is rotatable with said first slip ring component relative to said second slip ring component~~.

80. (Canceled)

81. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 79 ~~80~~, wherein said differential serial digital signal comprises a high speed differential serial digital signal.

82. (Currently Amended) A camera system, comprising:

a first slip ring apparatus, said first slip ring apparatus comprising:

a first slip ring component, said first slip ring component comprising at least one first dynamic interface component, [[;]] and

a second slip ring component, said second slip ring component comprising at least one second dynamic interface component, [[;]]

wherein said first slip ring component is coupled to circuitry configured to generate at least one high speed signal, [[;]]

wherein said first and second slip ring components are rotatably coupled together to form a slip ring boundary therebetween, said first and second dynamic interface components being positioned to interact with each other to communicate said at least one high speed signal across said slip ring boundary, said at least one high speed signal being processed by circuitry integrated within at least one of said first or second slip ring components;

an optical block coupled to said first slip ring apparatus so that it rotates with said first slip ring component relative to said second slip ring component, said first slip ring component being coupled between said optical block and said second slip ring component; and

a first drive actuator coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block relative to said second slip ring component;

wherein said first drive actuator is coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block in a pan axis direction; and

wherein said camera system further comprises a second slip ring apparatus coupled to said optical block and a second drive actuator coupled to said second slip ring apparatus to impart rotation to said optical block in a tilt axis direction.

83. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 82, wherein said high speed signal comprises a high speed digital signal.

84. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 82, wherein said high speed signal comprises a high speed analog signal.

85. (Currently Amended) A method of communicating at least one ~~at least one~~ high speed signal across a slip ring boundary, said method comprising providing a camera system that comprises ~~comprising~~:

~~providing~~ a first slip ring apparatus, said first slip ring apparatus comprising:

a first slip ring component, said first slip ring component comprising at least one first dynamic interface component, and

a second slip ring component, said second slip ring component comprising at least one second dynamic interface component,

wherein said first and second slip ring components are rotatably coupled together to form a slip ring boundary therebetween, said first and second dynamic interface components being positioned to interact with each other to communicate said at least one high speed signal across said slip ring boundary;

an optical block coupled to said first slip ring apparatus so that it rotates with said first slip ring component relative to said second slip ring component, said

first slip ring component being coupled between said optical block and said second slip ring component; and

a first drive actuator coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block relative to said second slip ring component;

wherein said first drive actuator is coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block in a pan axis direction;

wherein said camera system further comprises a second slip ring apparatus coupled to said optical block and a second drive actuator coupled to said second slip ring apparatus to impart rotation to said optical block in a tilt axis direction; and

wherein said method further comprises:

rotating at least one of said first and second slip ring components relative to the other of said first and second slip ring components, [[;]]

generating said at least one high speed signal, and [[;]]

~~processing said at least one high speed signal with circuitry integrated within at least one of said first or second slip ring components; and~~

communicating said at least one high speed signal across said slip ring boundary simultaneous with said rotation.

86. (Previously Presented) The method of claim 85, wherein said high speed signal comprises a high speed digital signal.

87. (Previously Presented) The method of claim 85, wherein said high speed signal comprises a high speed analog signal.

88. (Currently Amended) A camera system, comprising:

a first slip ring apparatus, said first slip ring apparatus comprising:

a first slip ring component, said first slip ring component comprising at least one first dynamic interface component, [[;]] and

a second slip ring component, said second slip ring component comprising at least one second dynamic interface component, [[;]]

wherein said first slip ring component is coupled to circuitry configured to generate at least one signal, [[;]]

wherein said first and second slip ring components are rotatably coupled together to form a slip ring boundary therebetween, said first and second dynamic interface components being positioned to interact with each other to communicate said at least one signal across said slip ring boundary at the same time at least one of said first and second slip ring components is rotating relative to the other of said first and second slip ring components; ~~and~~

an optical block coupled to said first slip ring apparatus so that it rotates with said first slip ring component relative to said second slip ring component, said

first slip ring component being coupled between said optical block and said second slip ring component; and

a first drive actuator coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block relative to said second slip ring component;

wherein said first drive actuator is coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block in a pan axis direction; and

wherein said camera system further comprises a second slip ring apparatus coupled to said optical block and a second drive actuator coupled to said second slip ring apparatus to impart rotation to said optical block in a tilt axis direction; and

wherein said at least one of said first and second slip ring components that is rotating relative to the other of said first and second slip ring components comprises at least one of integrated feedback circuitry, video processing circuitry, local control circuitry, or a combination thereof.

89. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 88, wherein said first slip ring component comprises a moving slip ring component and said second slip ring component comprises a stationary slip ring component; and wherein said first slip ring component comprises at least one of said integrated feedback circuitry, said video processing circuitry, said local control circuitry, or a combination thereof~~; and wherein said first slip ring component is configured to be coupled to an optical block so that said optical block is rotatable with said first slip ring component relative to said second slip ring component~~.

90. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 89, wherein said first slip ring component comprises integrated feedback circuitry.

91. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 89, wherein said first slip ring component comprises video processing circuitry.

92. (Currently Amended) The ~~slip ring apparatus~~ camera system of claim 89, wherein said first slip ring component comprises local control circuitry.

93. (Currently Amended) A method of operating a slip ring apparatus, said method comprising providing a camera system that comprises ~~comprising~~:

~~providing~~ a first slip ring apparatus, said first slip ring apparatus comprising:

a first slip ring component, said first slip ring component comprising at least one first dynamic interface component, and

a second slip ring component, said second slip ring component comprising at least one second dynamic interface component,

wherein said first and second slip ring components are rotatably coupled together to form a slip ring boundary therebetween, said first and second dynamic interface components being positioned to interact with each other to communicate said at least one signal across said slip ring boundary at the same time at least one of said first and second slip ring components is rotating relative to the other of said first and second slip ring components;

an optical block coupled to said first slip ring apparatus so that it rotates with said first slip ring component relative to said second slip ring component, said first slip ring component being coupled between said optical block and said second slip ring component; and

a first drive actuator coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block relative to said second slip ring component;

wherein said first drive actuator is coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block in a pan axis direction;

wherein said camera system further comprises a second slip ring apparatus coupled to said optical block and a second drive actuator coupled to said second slip ring apparatus to impart rotation to said optical block in a tilt axis direction; and

wherein said method further comprises:

rotating at least one of said first and second slip ring components relative to the other of said first and second slip ring components, ; and

performing at least one of the following steps or a combination thereof:

sensing a position of said first slip ring component relative to said second slip ring component using integrated circuitry that is rotating with said at least one of said first and second slip ring components, or

processing at least one video signal using circuitry that is rotating with said at least one of said first and second slip ring components, or

controlling at least one component that is rotating with said at least one of said first and second slip ring components using circuitry that is rotating with said at least one of said first and second slip ring components.

94. (Currently Amended) The method of claim 93, wherein said method further comprises ~~providing an optical block coupled to rotate with said at least one of said first and second slip ring components relative to the other of said first and second slip ring components;~~ rotating said optical block with said ~~at least one of said~~ first ~~and second~~ slip ring ~~components~~ component relative to ~~the other of~~ said ~~first and~~ second slip ring ~~components~~ component; and sensing a position of said first slip ring component relative to said second slip ring component using integrated circuitry that is rotating with said at least one of said first and second slip ring components.

95. (Currently Amended) The method of claim 94, wherein said method further comprises ~~providing an optical block coupled to rotate with said at least one of said first and second slip ring components relative to the other of said first and second slip ring components;~~ rotating said optical block with said ~~at least one of said~~ first ~~and second~~ slip ring ~~components~~ component relative to ~~the other of~~ said ~~first and~~ second slip ring ~~components~~ component; and processing at least one video signal using circuitry that is rotating with said at least one of said first and second slip ring components.

96. (Currently Amended) The method of claim 94, wherein said method further comprises ~~providing an optical block coupled to rotate with said at least one of said first and second slip ring components relative to the other of said first and second slip ring~~

~~components;~~ rotating said optical block with said ~~at least one of said~~ first ~~and second~~ slip ring ~~components~~ component relative to ~~the other of~~ said ~~first and~~ second slip ring ~~components~~ component; and controlling at least one component that is rotating with said at least one of said first and second slip ring components using circuitry that is rotating with said at least one of said first and second slip ring components.

97. (Currently Amended) A camera system, comprising:

a first slip ring apparatus, said first slip ring apparatus comprising:

a moving first slip ring component, said first slip ring component comprising a first slip ring component substrate that comprises a circular platter having a first planar interface surface defined thereon, and at least one first dynamic interface component supported by said first slip ring component substrate, and

a stationary second slip ring component, said second slip ring component comprising a second slip ring substrate that comprises a circular platter having a second planar interface surface defined thereon, and at least one second dynamic interface component supported by said second slip ring component substrate,

wherein said first and second slip ring components are rotatably coupled together so that said first slip ring component rotates relative to said second slip ring component, so that said first and second interface surfaces are disposed in mating facing relationship to form a slip ring boundary therebetween, and so that said first and second dynamic interface components are positioned to interact with each other to continuously communicate at least one signal across said slip ring

boundary at the same time said first slip ring component is rotating relative to said second slip ring component;

an optical block coupled to said first slip ring apparatus so that it rotates with said first slip ring component relative to said second slip ring component, said first slip ring component being coupled between said optical block and said second slip ring component; and

a first drive actuator coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block relative to said second slip ring component;

wherein said first slip ring component substrate comprises a printed circuit board;

wherein said first drive actuator is coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block in a pan axis direction; and

wherein said camera system further comprises a second slip ring apparatus coupled to said optical block and a second drive actuator coupled to said second slip ring apparatus to impart rotation to said optical block in a tilt axis direction.

98. (Previously Presented) The camera system of claim 97, wherein said second slip ring apparatus comprises:

a moving first slip ring component, said first slip ring component of said second slip ring apparatus comprising a first slip ring component substrate that comprises a circular platter having a first planar interface surface defined thereon, and at least one first dynamic interface component supported by

said first slip ring component substrate of said second slip ring apparatus; and

a stationary second slip ring component, said second slip ring component of said second slip ring apparatus comprising a second slip ring substrate that comprises a circular platter having a second planar interface surface defined thereon, and at least one second dynamic interface component supported by said second slip ring component substrate of said second slip ring apparatus;

wherein said first and second slip ring components of said second slip ring apparatus are rotatably coupled together so that said first slip ring component of said second slip ring apparatus rotates relative to said second slip ring component of said second slip ring apparatus, so that said first and second interface surfaces of said second slip ring apparatus are disposed in mating facing relationship to form a slip ring boundary of said second slip ring apparatus therebetween, and so that said first and second dynamic interface components of said second slip ring apparatus are positioned to interact with each other to continuously communicate at least one signal across said slip ring boundary of said second slip ring apparatus at the same time said first slip ring component of said second slip ring apparatus is rotating relative to said second slip ring component of said second slip ring apparatus; and

wherein said optical block is coupled to said second slip ring apparatus so that it rotates with said first slip ring component of said second slip ring apparatus relative to said second slip ring component of said second slip ring apparatus, said first slip ring component of said second slip ring apparatus being coupled between said optical block and said second slip ring component of said second slip ring apparatus.

II. RESPONSE TO OFFICE ACTION

Claims 1-7, 9-12, 14-26, 29-32, 35, 37, 40, 42, 46-50, 53-56, 59-64, 66-67, 74-76, 78-79, 81-85 and 88-97 have been amended to even more particularly point out and claim the subject matter of the claims. Claims 2, 28, 77 and 80 have been canceled without prejudice. Claims 1-7, 9-12, 14-26, 29-50 and 52-98 are pending in the present application.

A. Owens and Wakiyama References

As pointed out in the response to the previous Office Action, the Examiner has cited U.S. Patent No. 5,172,039 to Owens, and U.S. Patent No. 6,392,693 to Wakiyama in the text of the previous Office Action. However, these references were not listed in the Form PTO-892 that accompanied the first Office Action. To ensure that these references are included on the cover page of a patent granted based on this application, Applicants respectfully request that the Examiner list these two references on a Form PTO-892 and provide a copy of same to Applicants.

B. The Claim Amendments

The Examiner allowed claims 97 and 98, objected to claims 40 and 41, and rejected claims 1-7, 9-12, 14-39, 42-50 and 52-96 as being unpatentable over various references. Although Applicants respectfully disagree with the rejections of these claims, the Applicants with this paper amend the claims so that all pending claims include the below-noted limitations of allowed claim 97 of this application.

Applicant's representative discussed the possibility of submitting an After Final amendment with the Examiner on August 31, 2005, and the Examiner agreed to consider such an amendment.

More specifically, Applicants cancel claims 27 and 28, and amend objected to claims 40 and 41 so that they are written in independent form, including all of the limitations of the base claim and any intervening claims. Applicants also amend each of rejected independent apparatus claims 1, 15, 53, 74, 78, 82 and 88, and the claims dependent therefrom, to be camera system claims. Applicants further amend each of rejected independent claims 1, 15, 53, 74, 78, 82 and 88, as well as rejected independent method claims 42, 56, 85 and 93, to recite, in part, the following limitations from allowed independent claim 97 (emphasis added):

> "an optical block coupled to said first slip ring apparatus so that it rotates with said first slip ring component relative to said second slip ring component, said first slip ring component being coupled between said optical block and said second slip ring component; and
>
> a first drive actuator coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block relative to said second slip ring component;
>
> wherein said first drive actuator is coupled to said first slip ring apparatus to impart rotation to said first slip ring component and said optical block in a pan axis direction; and
>
> wherein said camera system further comprises a second slip ring apparatus coupled to said optical block and a second drive actuator coupled to said second slip ring apparatus to impart rotation to said optical block in a tilt axis direction."

With regard to the above limitations, Applicants note the Examiner's statement on page 10 of the Office Action that "none of the prior art of record discloses the combination of the limitations presented including the camera system further comprising a second slip ring apparatus coupled to said optical block and a second drive actuator coupled to said secpnd [sic] slip ring apparatus to impart rotation to said optical block." The above amendments have thus been made to place the claims in condition for allowance or, alternatively in better form for appeal (*see* MPEP 714.12). Furthermore, the amendments do not raise new issues requiring further consideration and/or search.

Other amendments that have been made include amendments to the claims dependent on the rejected independent claims to render them consistent with the amendments made to their respective independent claims. Furthermore, amendments have been made to independent claims 1, 15, 42, 53, 56, and 85 to remove limitations added to these claims in the amendment mailed February 4, 2005 in response to the previous Office Action. Dependent claims 29-39, 64 and 66-67 have also been amended to depend indirectly or directly from allowed claim 97 rather than canceled independent claim 27.

Applicants reserve the right to pursue the rejected and/or other claims in follow-on and/or other applications and to present arguments with respect to such claims in such applications. Furthermore, Applicants note that they do not amend or cancel claims because of the rejections over the cited references; rather, Applicants merely seek to facilitate compact prosecution and to expedite the issuance of a patent without agreeing with the rejections of these claims and without conceding that any of the cited references are prior art to the present application.

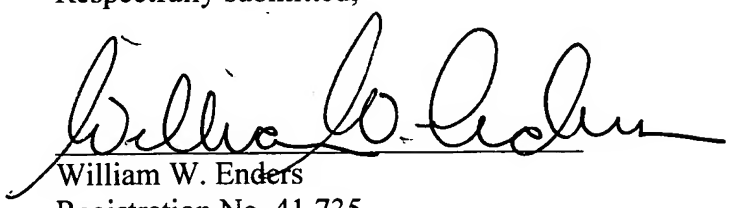
In view of the above, Applicants submit that all pending claims are allowable as now written following the amendments submitted herewith. Favorable reconsideration is requested.

C. Conclusion

The amended claims have been shown above to be allowable for the reasons given above. Applicants therefore respectfully submit that all of the pending claims are in condition for allowance. Reconsideration of the application and claims is courteously solicited.

The examiner is invited to contact the undersigned at the phone number indicated below with any questions or comments, or to otherwise facilitate expeditious and compact prosecution of the application.

Respectfully submitted,



William W. Enders
Registration No. 41,735
Attorney for Applicant

O'KEEFE, EGAN & PETERMAN
1101 Capital of Texas Highway South
Building C, Suite 200
Austin, Texas 78746
(512) 347-1611
FAX: (512) 347-1615